

MULTI-PHASED APPROACH TO LIFECYCLE MANAGEMENT OF HAZARDOUS MATERIALS (#175)

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INTRODUCTION

Fort Lewis Military Reservation is an 86,176 acre Army installation located 35 miles south of Seattle and 7 miles northeast of Olympia. Various military and non-military organizations at Fort Lewis perform services and functions that require the use of hazardous substances and generate hazardous waste. These activities are vital to the field readiness of military troops and support the day-to-day functions of Fort Lewis as a community. Services include the maintenance of over 4,500 Fort Lewis buildings and infrastructure such as roads and utilities, operation and maintenance of over 3,000 vehicles and nearly 1,500 pieces of equipment including aircraft, weapons systems, power generators, and communications equipment. A major hospital, several medical and dental clinics, printing and graphics facilities, materials storage warehouses and crafts shops also operate on Fort Lewis.

Fort Lewis, the largest employer in Pierce County, has a combined military, civilian and retiree payroll of almost \$1 billion. Fort Lewis' force structure includes I Corps Headquarters, which commands all Forces Command units at Fort Lewis. I Corps Headquarters conducts planning and also acts as a liaison with other active and reserve component units in the continental United States and active duty units located around the Pacific Rim and in Hawaii. Fort Lewis directly supports the Yakima Training Center and six Base Realignment and Closure installations in Washington and California. The installation also serves occasional users from other U.S. armed services and units from allied nations.

PROGRAM OVERVIEW

Tracking hazardous material procurement, storage, usage, and waste generation is one of the greatest challenges facing Fort Lewis. Understanding the lifecycle of a material and its movement through storage, use and waste generation is difficult. Overlapping management responsibilities and sometimes-conflicting guidance between logistics, safety, preventive medicine and environmental regulations presents interesting challenges. To meet the challenge, various business practices have been implemented over the last seven years to better manage hazardous materials.

Fort Lewis developed a multi-phased approach to achieve proactive management of hazardous materials throughout their lifecycle. We targeted programs and projects that placed the installation in a better compliance status. In 1991, Fort Lewis identified better management of hazardous waste as the top priority, and also implemented a pollution prevention program. Between 1992-1995, the installation developed various tools to help forecast usage of hazardous materials and waste generation. Documentation on processes and chemical usage was then developed. The post established hazardous material inventories and developed a database to

track storage locations. From 1994-1995, Fort Lewis completed a study on centralizing hazardous material procurement. In 1996, the post received approval to establish a process action team to implement the hazardous material control center (HMCC). In March 1998, the HMCC opened supporting all hazardous material users on Fort Lewis. The Hazardous Substance Management System will be in limited operation in August 1998.

TECHNIQUES AND INNOVATIONS

In 1991, Fort Lewis established and implemented a new concept for hazardous waste management: the One-Stop Hazardous Waste Management Program. Under this program, the hazardous waste management process is simplified for the units and installation activities.

Prior to the implementation of the One-Stop Program, soldiers were responsible for disposing of hazardous waste in accordance with the local, state and federal regulations. Under the old system, the soldiers were guided through a regulatory and paperwork maze for hazardous waste turn-in. If all went right, it was “only” a ten step process requiring appointments with three different agencies.

The soldier’s requirements under the new system are simply to identify the material, call Public Works and assist in repackaging the material (if the material is not already in a package suitable for transporting). Today, only four steps are required to dispose of the waste, and the soldier has to work with only one agency. Public Works personnel complete all the other tasks required to dispose of hazardous waste.

Comparison of Hazardous Waste Disposal Steps: Old System vs. One Stop	
Old System	One Stop
<ol style="list-style-type: none"> 1. Order container 2. Call Public Works for guidance 3. Do paperwork 4. Call ISSD for turn-in appointment 5. Dispatch truck 6. Load truck 7. Public Works inspects 8. Get appointment with DRMO 9. Transport to DRMO 10. DRMO inspects/ receives waste 	<ol style="list-style-type: none"> 1. Unit gets training 2. Unit issued waste container 3. Unit calls for pick up 4. Public Works personnel picks up waste and delivers container to DRMO

In 1992, Fort Lewis implemented a computerized hazardous waste tracking system to track hazardous waste from the point of generation to the movement into the permitted storage facility operated by the Defense Reutilization and Marketing Office. Full operational capability of the system was reached in 1995. This system ensures compliance with the 90-day accumulation regulation. Annual modifications to this system have allowed Fort Lewis to comply with regulatory changes. Hazardous waste is only collected in containers issued, bar-coded, and tracked by Public Works. This system provides an accounting of the time hazardous waste begins to be accumulated in the container until it is disposed of through the Defense Reutilization and Marketing Office.

Program control was initially maintained by centralizing the funding of the hazardous waste disposal program with Public Works. Using the computer system, Fort Lewis now tracks disposal costs by the DODAC (Department of Defense Accounting Code), making hazardous waste disposal a reimbursable service that rewards units minimizing waste generation.

Once the waste end of the lifecycle was under control, it was possible to start moving upstream to document how the waste was generated, what process generated the waste and what materials used in the process caused the waste to be generated.

This documentation led to the development of process flow diagrams for major process areas on Fort Lewis. Materials used in the process and waste generated were identified, leading to the development of waste stream identification numbers. These numbers allow standardization of the process flow diagrams and streamline compliance reporting in hazardous waste, pollution prevention and Emergency Planning and Community Right to Know Act (EPCRA).

We knew the type of materials used in each process, and the type of waste generated in each process, but we did not know the quantity of the materials used. We needed to forecast hazardous substance use, because the hazardous material data collected from the logistics systems did not provide the detail required for compliance reporting under pollution prevention. In 1993-1994, Fort Lewis developed a forecasting tool to predict material use based on equipment and processes on post. Verified in 1995 ($\pm 10\%$), and used to predict use and waste generation in 1996, this tool is used to prepare the TRI report where actual use data is not available.

In 1995, Fort Lewis developed a Business Integrated Definition model to document the current procedure to obtain, store and distribute hazardous materials. Fort Lewis also evaluated a centralized hazardous material control center as an alternative to the current logistics procurement system. This model is now being used to facilitate the reengineering of the procurement systems at Fort Lewis. In 1996, we received approval from the Command Group to begin design and implementation of the hazardous material control center (HMCC).

Hazardous materials used on Fort Lewis can be classified into two major categories: materials specified by a technical manual and materials "desired" for a specific job, or used in a specific process. Technical manual-specified materials cannot be replaced without approval from the program manager. Ban lists have been developed and include ozone-depleting substances and items that are reportable under the Clean Air Act, EPCRA, and the Pollution Prevention Program. Fort Lewis is now developing authorized use lists (AUL) for those hazardous materials that are "desired" to do a specific job. The technical manual expendable items list and the lubrication order are being used to develop the AUL for units based on equipment they are authorized to have. The ban list and AUL are dynamic documents and are updated as needed, at least once per year.

Environmental operating certificates are being developed for all organizations on post. These certificates identify current processes, materials used in the processes as specified by technical manuals, and wastes generated from the processes. Furthermore, these certificates provide the organization with an authorized use list of hazardous materials that can be procured through the hazardous material control center, a list of waste authorized for generation, and the waste stream serial number of that specific waste stream.

The implementation of the HMCC is a joint effort between Public Works Environmental Division and Directorate of Logistics Supply Division. Approval to begin implementation was received in November 1996 by the Garrison Commander. The HMCC officially opened for business 16 March 1998. This is one of the most significant actions that any facility can take to achieve "total" HM management. We have transformed from a decentralized HM procurement system to a wholly centralized one.

Directorate of Logistics (DOL) operates the HMCC. This includes centralized HM order, issue, storage; distribution to authorized users in quantities limited to immediate needs. Initially, the collection and reissue of unused serviceable HM was being done on a free issue basis. This practice has been suspended at the direction of the post accountant. A standing operating procedure (SOP) for internal and external operations has been developed.

Public Works-Environmental and Natural Resources Division (PW-ENRD) identifies products that are considered hazardous and develops a mechanism to ensure these products are managed through the HMCC. An AUL for HM is being developed based on processes within the organization. The AUL will become the shopping list for the HMCC. PW-ENRD reviews, coordinates with Safety and Preventive Medicine, and approves requests for products not on the AUL. PW will maintain an authorized substitute list and a RUL. A HM substitution program is being developed. The overall goal is to provide the least hazardous product to the customer to do the required job.

A working group involving Finance and Accounting personnel has been established. This group is meeting quarterly to discuss issues associated with using the IFSM system, stock fund accounting, HSMS implementation, and other financial concerns. Other issues have surfaced during these meetings. Most recently, the post accountant identified that we could not offer HM through free issue. There is an existing policy that requires all HM drawn from DRMO be charged at full AMDEP price. This working group will proceed with a reengineering initiative to get this policy changed. This is an Army only policy. The success of the HMCC is dependent on the use of the free issue/ less than retail products as one means to be re-imbursable.

HSMS implementation is being supported by contract through the Army Environmental Center. HSMS Implementation formally began with the Initial Site Visit (ISV) conducted the week of December 15, 1997. The Functional Kick-Off (FKO) visit and the HSMS Implementation Technical Site Survey (TSS) was conducted concurrently during the week of February 9, 1998. The successful concurrent surveys were only possible due to extensive pre-planning by Fort Lewis, contractors supporting implementation, and Project Manager Sustaining Base Automation (PM-SBA). This effort will decrease the implementation cycle time by 30 days.

The initial operational capability (IOC) for HSMS has been defined. The supporting contractor is currently doing the Functional Implementation Process. PM-SBA will do the HSMS hardware and software installation during the week of 13 July 1998. Supporting contractors will provide HSMS training during the week of 27 July 1998. The supporting contractor inventory team will do functional implementation 20 July through 14 August 1998. IOC is currently scheduled for 14 August 1998.

IOC will only cover inventory and bar coding of HM in the HMCC, 1/37 BN, and DOL-Repair Activity Division (RAD). We currently have over 300 sites reporting HM on a quarterly basis. Our goal is to shorten the cycle time for reaching full operational capability (FOC). To achieve this, PW-ENRD is working with the supporting contractor to identify data that can be pre-loaded into the system. We are currently doing a QA/QC check on existing data. Our goal is to do a complete preload of all organizations into the cost center module of the HSMS. This will allow us to track HM to a storage location. In addition, development of functional process links to HM usage will be completed for at least 30% of the organizations. We are standardizing processes for military units at organizational level. The goal is to develop similar processes at the DS level. By standardizing processes, FOC should be easier to achieve. In addition, using HSMS for an EPCRA reporting tool should be easier.

CONCLUSIONS

The development of a comprehensive material management program that encompasses all aspects of the lifecycle has improved the overall management of hazardous materials on Fort Lewis and has been instrumental in achieving and exceeding our pollution prevention performance goals. Tracking hazardous waste and serializing the waste streams allows Fort Lewis to stay in compliance and track reduction trends. Data collection for EPCRA reporting and implementation of the HSMS will allow us to control volumes of HM stored on post and may reduce reporting burdens. Implementation of the HMCC and HSMS tracking system will help Fort Lewis reduce the volume of HM downgraded to HW by centralizing control and enforcing operational loads.